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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/511,256	11/16/2005	Paul Weaver	PBT.P0004	8735

7590 03/01/2007  
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EXAMINER
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ROSENAU, DEREK JOHN

ART UNIT	PAPER NUMBER
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2834

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/01/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	Application No. 10/511,256	Applicant(s) WEAVER ET AL.	
	Examiner Derek J. Rosenau	Art Unit 2834	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 December 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 3-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 December 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to: See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Drawings*

1. The drawings were received on 18 December 2006. These drawings are accepted.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 and 3-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okada (US 6483226) in view of Hasegawa et al. (US 6486743).
4. With respect to claim 1, Okada discloses a control circuit (Fig 7) for controlling the operation of a piezo ceramic actuator (item 3) comprising means for applying a voltage to the piezo ceramic actuator (item 12), the voltage applying means being arranged such that a charge is applied to the piezo ceramic device which in turn produces a displacement of the piezo ceramic device (column 3, lines 27-34), wherein the voltage applying means is arranged to apply a reverse bias voltage to the actuator (column 3, lines 35-45).

Okada does not disclose expressly a means for generating a control signal indicative of the temperature of the actuator and means for altering the amount of reverse bias voltage as a function of the control signal.

Hasegawa et al. teaches a means of controlling a piezoelectric actuator including a means for generating a control signal indicative of the temperature (Fig 1, item 34) of the actuator and

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means for altering the amount of reverse bias voltage as a function of the control signal (item 28B and column 6, lines 57-62).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the temperature compensation means of Hasegawa et al. with the control circuit of Okada for the benefit of adjusting for changes caused by a change in temperature (column 6, lines 57-62 of Hasegawa et al.).

5. With respect to claim 3, the combination of Okada and Hasegawa et al. discloses the control circuit according to claim 1. Okada discloses that the means for applying a voltage includes an H-bridge (Fig 7).

6. With respect to claim 4, the combination of Okada and Hasegawa et al. discloses the control circuit according to claim 3. Okada discloses that the H-bridge is provided with a plurality of switches arranged to charge and discharge the piezo ceramic device (Fig 7 and column 3, lines 35-45).

7. With respect to claim 5, the combination of Okada and Hasegawa et al. discloses the control circuit according to claim 4. Okada discloses that the plurality of switches are transistor switches (Fig 7).

8. With respect to claim 6, the combination of Okada and Hasegawa et al. discloses the control circuit according to claim 3. Okada discloses that the H-bridge is configured to apply a reverse bias voltage to the actuator (column 3, lines 35-45).

9. With respect to claim 7, the combination of Okada and Hasegawa et al. discloses the control circuit according to claim 1. Okada discloses a piezo ceramic actuator (item 3) and a control circuit (item 10).

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10. With respect to claim 8, the combination of Okada and Hasegawa et al. discloses the control circuit according to claim 1. Okada discloses that the means for applying a voltage includes an H-bridge (Fig 7).

11. With respect to claim 9, the combination of Okada and Hasegawa et al. discloses the control circuit according to claim 8. Okada discloses that the H-bridge is provided with a plurality of switches arranged to charge and discharge the piezo ceramic device (Fig 7 and column 3, lines 35-45).

12. With respect to claim 10, the combination of Okada and Hasegawa et al. discloses the control circuit according to claim 9. Okada discloses that the plurality of switches are transistor switches (Fig 7).

13. With respect to claim 11, the combination of Okada and Hasegawa et al. discloses the control circuit according to claim 8. Okada discloses that the H-bridge is configured to apply a reverse bias voltage to the actuator (column 3, lines 35-45).

14. With respect to claim 12, the combination of Okada and Hasegawa et al. discloses the control circuit according to claim 4. Okada discloses that the H-bridge is configured to apply a reverse bias voltage to the actuator (column 3, lines 35-45).

15. With respect to claim 13, the combination of Okada and Hasegawa et al. discloses the control circuit according to claim 9. Okada discloses that the H-bridge is configured to apply a reverse bias voltage to the actuator (column 3, lines 35-45).

16. With respect to claim 14, the combination of Okada and Hasegawa et al. discloses the control circuit according to claim 5. Okada discloses that the H-bridge is configured to apply a reverse bias voltage to the actuator (column 3, lines 35-45).

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17. With respect to claim 15, the combination of Okada and Hasegawa et al. discloses the control circuit according to claim 10. Okada discloses that the H-bridge is configured to apply a reverse bias voltage to the actuator (column 3, lines 35-45).

***Response to Arguments***

18. Applicant's arguments filed 18 December 2006 have been fully considered but they are not persuasive. Applicant argues that Okada does not disclose generating a control signal indicative of the temperature and means for altering the amount of reverse bias voltage as a function of the control signal. However, these limitations, which are now added to claim 1 were previously included in claim 2 and were rejected over Okada in view of Hasegawa et al.

Applicant argues that Hasegawa et al. is non-analogous art, as it relates to adjusting sensitivity and output amplitude of an oscillator in an AC system, which differs from the DC system of applicant's invention. First, the claims as currently written do not require DC. Also, Hasegawa teaches a piezoelectric device in which sensitivity and output amplitude are adjusted by adjusting the DC bias of an AC signal. Applicant argues that Hasegawa et al. is not related to piezoelectric actuators. However, as can be seen at column 4, lines 46-50, the oscillator of Hasegawa et al. may be a piezoelectric oscillator. Applicant argues that the advantages associated with the new features (previously claim 2) are not taught or suggested in Hasegawa et al.; however, it can be seen at column 6, lines 57-62 that Hasegawa does disclose an advantage for these features.

Applicant argues that Hasegawa et al. does not address the problem of hysteresis compensation, and does not provide a solution for addressing such a problem. However, Hasegawa et al. does not need to provide a solution to this problem, as the combination of Okada and Hasegawa provide all of the structural limitations required by the claims.

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19. In response to applicant's argument that the combination of Okada and Hasegawa et al. does not provide the unexpected benefit of maximizing the mechanical displacement envelope of the actuator across a wide range and providing compensation for hysteresis, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

20. Applicant's arguments, see amendment, filed 18 December 2006, with respect to claims 1-15 have been fully considered and are persuasive. The 35 U.S.C. 102 rejections of claims 1-15 over Weaver et al. have been withdrawn.

#### ***Conclusion***

21. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derek J. Rosenau whose telephone number is 571-272-8932. The examiner can normally be reached on Monday thru Thursday 7:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Derek J Rosenau  
Examiner  
Art Unit 2834

DJR  
2/20/2007

